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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,154	02/27/2004	Dennis S. Greywall	35-19	9017

7590 07/19/2006

Docket Administrator (Room 3J-219)
Lucent Technologies Inc.
101 Crawfords Corner Road
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EXAMINER

LAMBELET, LAWRENCE EMILE

ART UNIT PAPER NUMBER

1732

DATE MAILED: 07/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/789,154	Applicant(s) GREYWALL ET AL.	
	Examiner Lawrence Lambelet	Art Unit 1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 14 and 22-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13, 15-21, and 28-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of claims 1-13, 15-21 and 28-31 in the reply filed on 5/26/2006 is acknowledged. Applicant correctly states that claims 28-31 were not placed in either of the two groups of the restriction and should be properly placed with the elected Group I claims, drawn to method.

The traversal is on the ground(s) that the product, a fiber having oriented carbon particles, is defined by the process of the elected claims, a method of making such a fiber. This is not found persuasive because the applicant has failed to show that the product would be materially different if made by another method. The inventions are distinct because an alternative method, namely gel-spinning, can make substantially the same product. Consequently, the inventions require different examinations in view of their respective classifications, thereby placing a burden on the Office.

The requirement is still deemed proper and is therefore made FINAL.

Claims 14 and 22-27 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to nonelected Group II claims. Applicant timely traversed the restriction (election) requirement in the reply filed on 2/26/2006.

Specification

The disclosure is objected to because of the following informalities: The word "in" is missing between "still" and "tapering" at line 22 on page 4. Appropriate correction is required.

Claim Objections

Claim 11 is objected to because of the following informalities: The phrase "is comprises" is grammatically incorrect. Either "is" or "comprises" should be deleted. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not give adequate details regarding the composition of PS2067. Product codes are often subject to obsolescence and poor archival regulation.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The composition of PS2067 is undefined. For the purpose of examination, PS2067 will be interpreted as any ultraviolet curable liquid.

Claim Rejections - 35 USC § 103

Claims 1-3, 10-12, and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lobovsky et al (U.S. Patent 6,682,677), and further in view of Yodh et al (U.S. Patent Application Publication 2006/0099135).

Lobovsky et al, hereafter "Lobovsky", discloses a method of assembling carbon particles into fibers, as recited in claims 1 and 19. Lobovsky teaches flowing a liquid containing a dispersion of carbon particles through a tapering tube at lines 28-35 in column 5, lines 59-63 in column 5, and in Fig. 4. At the same citation, Lobovsky further teaches dispersing carbon particles in the mixture, as required by claim 2. The carbon particles of Lobovsky are nanotubes, as required by claims 12 and 20. Lobovsky also teaches spooling a fiber on a take-up drum, as required by claim 10, in Fig. 11.

Lobovsky does not teach using a curable liquid and curing the liquid near the end of the tapering tube, as required by claims 1 and 19, or partially curing at locations before and after the end, as required by claims 16 and 18. Lobovsky also does not teach using a UV curable liquid, as required by claim 11, or using UV light to cure, as required by claims 3 and 15, or providing UV translucency, as required by claim 17.

Yodh et al, hereafter "Yodh", does teach using a curable precursor in paragraph [0077]. One of ordinary skill in the art would have found it obvious to locate the curing event near the end of the tube, instead of upstream where a solid mass formed too soon would clog the tube, or downstream where a free-flowing liquid stream would break apart. It would have been further obvious to one of ordinary skill that the curing event could bridge the end of the tube in a relatively narrow region by progressively

proceeding from partial cure to full such that the phase transition neither blocks nor necks.

Yodh further teaches using UV light, and by implication a UV curable precursor, in paragraph [0094]. It would have been obvious to one of ordinary skill in the art to provide the tube with translucency to UV light in order to partially cure before the end of the tube.

Lobovsky and Yodh are combinable because they are concerned with a similar technical field, namely, carbon nanotube filaments. One of ordinary skill in the art at the time of the invention would have found it obvious to include in the method of Lobovsky the curable matrix of Yodh, and would have been motivated to do so to eliminate process steps, such as coagulating and drying the fiber.

Claims 4 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lobovsky in view of Yodh, as applied to claims 1-3, 10-12, and 15-20 above, and further in view of Smalley et al (U.S. Patent Application Publication 2002/0159943).

Lobovsky and Yodh disclose the method of claims 1-3, 10-12, and 15-20, as discussed above.

Lobovsky and Yodh do not teach heating the fiber, as required by claim 7, or heating to drive off volatiles, as required by claim 4, or heating to sinter, as required by claim 8. Lobovsky and Yodh further do not teach increasing the density, as required by claim 6.

Smalley et al, hereafter "Smalley", does teach heating carbon nanotube mixtures to remove carbon contaminants in the Abstract. Removing the contaminants from the

mix would create denser packing of nanotubes. Applying heat to temperatures near the melting point of the fiber would be an obvious matter of choice for one skilled in the art. Doing so would involve sintering of at least some of the carbon particles.

Lobovsky, Yodh and Smalley are combinable because they are concerned with a similar technical field, namely, carbon nanotube assemblies. One of ordinary skill in the art at the time of the invention would have found it obvious to include in the method of Lobovsky and Yodh the purification and consolidation techniques of Smalley, and would have been motivated to do so to strengthen the resulting fiber.

Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lobovsky in view of Yodh, as applied to claims 1-3, 10-12, and 15-20 above, and further in view of Islam et al (U.S. Patent Application Publication 2005/0054830).

Lobovsky and Yodh disclose the method of claims 1-3, 10-12, and 15-20, as discussed above.

Lobovsky and Yodh do not disclose a step of twisting, as required by claim 5.

Islam et al, hereafter "Islam" does disclose a process of twisting to make fiber in paragraph [0032].

Lobovsky, Yodh and Islam are combinable because they are concerned with a similar technical field, namely, fiber extrusion. One of ordinary skill in the art at the time of the invention would have found it obvious to include in the method of Lobovsky and Yodh the method to change morphology, as taught by Islam, and would have been motivated to do so to enhance the binding forces in the fiber.

Lobovsky and Yodh do not disclose a step of cladding, as required by claim 9.

Islam does teach a step of coating, or otherwise cladding, in paragraph [0017].

One of ordinary skill in the art at the time of the invention would have found it obvious to include in the method of Lobovsky and Yodh the finish treatment of Islam, and would have been motivated to do so to enhance process-ability of the fiber.

Claims 13 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lobovsky in view of Yodh, as applied to claims 1-3, 10-12, and 15-20 above, and further in view of Ko et al (U.S. Patent Application Publication 2005/0228110).

Lobovsky and Yodh disclose the method of claims 1-3, 10-12, and 15-20, as discussed above.

Lobovsky and Yodh do not teach carbon particle composition as fibrils.

Ko et al, hereafter Ko, does teach a fibril composition in the Abstract.

Lobovsky, Yodh and Ko are combinable because they are concerned with a similar technical field, namely, carbon nanotube filaments. One of ordinary skill in the art at the time of the invention would have found it obvious to include in the method of Lobovsky and Yodh the longer length structure of Ko, and would have been motivated to do so to reinforce the fiber.

Claims 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lobovsky in view of Yodh, Smalley, Islam, and Ko, as applied to claims 1-13, and 15-21 above.

Lobovsky, Yodh, Smalley, Islam and Ko disclose the method of claims 1-10, 12-13, and 15-21, as discussed above.

Specifically, Lobovsky teaches flowing a liquid containing a dispersion of carbon particles through a tapering tube, as required by claim 28, at lines 28-35 in column 5, lines 59-63 in column 5, and in Fig. 4. Lobovsky further teaches carbon nanotubes, as required by claim 30, at the same citation.

Yodh teaches curing using UV light, as required by claim 28, in paragraph [0094]. One skilled in the art would have found it obvious to cure near the second end of the tube.

Smalley teaches heating the fiber to drive off volatiles, as required by claim 28, in the Abstract. Heating to the point of sintering would have been obvious as a matter of choice for one skilled in the art.

Islam teaches a step of twisting, as required by claim 28, in paragraph [0032]. Islam further teaches a step of coating, or cladding, as required by claim 29, in paragraph [0017].

Ko teaches carbon particles as fibrils, as required by claim 31, in the Abstract.

Lobovsky, Yodh, Smalley, Islam and Ko are combinable because they are concerned with a similar technical field, namely, carbon particulate assemblies. The motivations for one of ordinary skill in the art at the time of the invention to make these combinations would include eliminating process steps, strengthening the fiber, enhancing process-ability of the fiber, and reinforcing the fiber.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following documents are cited to further show the state of the art with regard to methods of forming anisotropic carbon fibers:

U.S. Patent 6,299,812 to Newman et al

U.S. Patent Application Publication 2005/0239948 to Haik et al (not prior art)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence Lambelet whose telephone number is 571-272-1713. The examiner can normally be reached on 8 am-4:30 pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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PRIMARY EXAMINER
7/14/06